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ABSTRACT

A study compared cognitive style (field dependence/independence) and learning style (reflection/impulsion) with reading achievement. Twenty-six sixth grade students were administered the group Embedded Figures Test to determine field dependence/independence and the Matching Familiar Figures Test to determine reflective and impulsive students. Reading achievement scores were obtained from school records. No significant relationship was found between either cognitive style or learning style and reading achievement. (Author/FL)

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Relationships Among Cognitive Style, Learning Style and Reading Skills

By

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Submitted in partial fulfillment of the requirements
for the Master of Arts degree in Education at
Kean College of New Jersey
April, 1981

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CHAPTER 1

THE PROBLEM

Educators are concerned with those processes that influence a student's ability to learn. They are perplexed about a student's poor reading achievement and need to determine what additional factors are related to a student's reading ability.

There are many variables that effect how and what a child learns. To improve instruction, the total child must be considered. An awareness of a child's cognitive style and learning style may enable more efficient instruction to meet student's needs.

In order for reading instruction to improve, the relationship between cognitive style, learning style and reading skills must be examined. Much research has been done in the area termed "cognitive style" over the past twenty years (Cox, 1976). Also, there is evidence that student learning styles are important in what and how well students learn (Eldridge, 1980). How these two areas, cognitive style and learning style, influence a student's reading ability must be investigated.

Statement of the Problem

The purpose of this study is to determine the relationship among cognitive style (field dependence/field independence), learning style and reading vocabulary and comprehension.

Hypotheses

1. There is a positive relationship among cognitive style (field dependence/field independence), reading vocabulary and reading comprehension.

2. There is a positive relationship among learning style, reading vocabulary and reading comprehension.

Significance of the Problem

In the educational field, there is a need to know more about the student and how he learns. In order for instruction to be more effective, information about the student--his cognitive style and learning style--is needed. There is a great amount of individual differences in reading behavior of children and adults. An awarness of cognitive style and learning style may enable the teacher of reading to use more appropriate methods of instruction and have a better understanding of the student's needs. Analysis of cognitive styles and learning styles may enable more efficient planning of reading programs to meet individaul needs and may also prevent reading failure by placing the student in the correct reading program, based upon his cognitive and learning styles.

Smith (1973) found a significant relationship between field dependence/field independence and reading comprehension. He concluded that cognitive style tests could provide useful information to a reading teacher. Stuart (1967) found a positive correlation between field independence and reading achievement using seventh and eighth grade students. Significant relationships between field dependence/field independence and reading achievement were also found with fourth graders by Conoley (1977) and Kaplan (1970).

First, second and third grade boys that were field independent were better readers than field dependent boys

in the same grade, as discovered by Watson (Blanton & Bullock, 1973; Daku, 1978). Cox (1976), in a study with kindergarten readers, found that field independent children were not more likely to be early readers than field dependent children. No significant difference in cognitive style between early and non-early readers was found.

Cognitive style was found to be a moderate predictor of reading success for boys, but not for girls by Gill, Herdtner and Lough (1968).

Robinson and Gray (1974) suggest that the relationship between a particular style of learning may be an important consideration prior to assigning children to different instructional treatments or to instructing them in the use of a particular style.

There is a need to understand how and what a child learns. Grasha (1972) identified learning styles as how individuals approach the learning environment in the classroom. Bruner (1966) stated that before knowledge can be effectively communicated and learned, learning style should be considered.

Definition of Terms

Cognitive Style

Cognitive style denotes individual differences in the mode of cognitive functioning displayed by individuals. It is referred to as Field Dependence and Field Independence by Witken (1962) and indicates if a person is analytical or global on a continuum in his perception and intellectual processes.

Field Dependent

A Field Dependent (FD) person is generally unable to function independently and lacks initiative. He is an anxious person and is more global in his perception. FD

individuals tend to confuse an object and its surrounding field so that separation can not be made easily.

Field Independent

A Field Independent (FI) person is active in his environment, can take initiative and organize. He is able to function independently and is able to keep an object separate from its surrounding field. He is more analytical in his perception of the world.

Learning Style

Learning Style indicates how an individaul approaches the learning environment in the classroom. It also indicates a student's dominant preference of learning.

Reading Vocabulary

Reading vocabulary, for this study, was measured by the raw score on the vocabulary subtest of the Iowas Tests of Basic Skills.

Reading Comprehension

Reading comprehension, for this study, was measured by the raw score on the comprehension subtest of the Iowas Tests of Basic Skills.

Assumptions and Limitations

The following assumptions are relevant to this study.

1. The Group Embedded Figures Test, Matching Familar Figures Test, and the Iowa Tests of Basic Skills will yield statistically accurate and reliable information.

2. The researcher will attempt to duplicate a study which determined the relationships among cognitive style, learning style and targeted reading skills of 18 college students utilizing children in the sixth grade.

3. Students will be unaware of the study.

The following limitations pertain to this study.

1. The study will be carried out with only 26 students.

2. The study will only be concerned with students at the sixth grade level.

3. The students come from white, middle-class families.

Summary

In summary, this study will attempt to determine if two factors, cognitive style (field dependence/field independence), and learning style, are important to sixth graders in relation to reading skills (vocabulary and comprehension) using correlational statistical techniques.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

People vary greatly in the way in which they learn a specific task or gather information. There is variability in the way each individual processes information and in the way he approaches instruction (Coop and Sigel, 1971). Some people acquire information better through manipulation of objects, others by reading, some by listening and some by watching a demonstration (Cross, 1976). These individual differences are labeled cognitive style by psychologists (Blanton & Bullock, 1973; Cross, 1976).

Educators are concerned with those processes that influence a student's ability to learn. Witkin (1973) feels that students' academic choices and development and how they learn is strongly influenced by their cognitive style. Coop and Sigel (1971) have found educational implications of cognitive style for the classroom teacher. Individuals with distinctive cognitive styles in specific areas have strengths that are directly related to their cognitive style (McKenny, James & Keen, 1974).

Grasha (1972) defines individual learning styles as how the individual approaches the learning environment in the classroom. Cognitive theorists feel that instructional material should be organized to augment these internal processes (Stasy & Shawlson, 1976).

Relationships between particular learning styles may be important to consider before assigning children to specific instructional treatments or instructing them in a particular style (Robinson & Gray, 1974). Teachers also have cognitive styles and usually teach by the methods that are most comfortable to them (Cross, 1976). Research has shown that learners with certain cognitive styles are

hampered or assisted by a particular teaching method which they have been exposed to (Sigel & Sigel, 1965). Teachers should be aware of student needs and learning styles. The classroom teacher needs ways to assess and interpret student learning styles easily and accurately (Riechmann & Grasha, 1974; Stasy & Shawlson, 1976).

Since there is a great amount of individual differences in reading behavior among people, an awareness of cognitive style may enable the teacher of reading to use more appropriate methods of instruction and enable more efficient planning of reading programs to meet individaul needs. Beller (1967) demonstrated that specific teaching methods could be designed to facilitate the learning of nursey school children when cognitive styles were identified and used. This chapter will explore the research available on cognitive styles and how it relates to reading skills.

Cognitive Style

At least a dozen different cognitive styles have been studied. The style selected for this study was field dependence versus field independence. This style was chosen since "...it holds a substantial lead over any other dimension in the extent and quality of research..." (Cross, 1976, 116). The field-independent person is able to function independently and is able to keep an object separate from its surrounding field. He is analytical in his perception of the world. The field-dependent person is generally unable to function independently and tends to confuse an object and its surrounding field. He tends to be more global in his perception of the world than the field-independent person.

Cognitive styles are studied in a hope of relating them to the reading processes and arriving at a better understanding of these processes.

Field Dependence/Field Independence and Reading

Reading, from a perceptual point of view, is "...the process of separating meaningful cues from their surrounding field and imposing perceptual structure upon the printed page." (Cox, 1976). Poor readers have difficulty attending to a figure in a field and become inhibited by a distracting background (Elkind, Larson & Van Doorninck, 1965). Inferiority was found in poor readers, when compared to good readers, on measures of auditory and visual perception tests according to Bruinenles (Cox, 1976). The reader should be able to pick out the figure from the background if he is to cope with the printed page (deHirsch, 1957). Experiments with an embedded figures test illustrated that field-dependent people were unable to pick out figures in a complex design, whereas field-independent people had no difficulty (Cross, 1976).

This chapter deals with field dependence/field independence and reading in two sections. First, the elementary child will be discussed and secondly, adults.

Cognitive Style and Reading--Elementary Child (K-8)

Much research has demonstrated that there is a significant relationship between field-dependent/field-independent (FD/FI) and reading achievement (Chester, 1974; Fiebert, 1967). Smith (1973) also found this to be true and concluded that cognitive style tests could be useful to the reading teacher. Chester (1974) stated that different children have different styles of learning and that these styles may play an important role in learning to read. His research demonstrated that in primary and elementary grades FI students were better readers than FD students. Witkin (1973) found that children with learning difficulties, especially in the area of reading, tended to be FD. Gill, Herdtner & Lough (1968), in their study of nursey, kindergarten and first grade students, concluded

that cognitive style was a moderate predictor of reading success for boys but not for girls. Peterson & Magaro (1969) found a trend for FD to need more trials to learn embedded figures than FI. They suggested that FD would need more time to master reading type tasks than FI. Witkin (Peterson & Magaro, 1969) found that young children showed more signs of FD but that FI increased with maturity.

Cox (1976) did a study to investigate FD/FI and reading success with kindergarten children. She found that FI children were not earlier readers than FD children. She also discovered that there was no significant difference in cognitive style and early and non-early readers.

Gluck (1972) did a first grade study to explore the relationship between paragraph meaning and FI. A significant relationship between the two (paragraph meaning and FI) was found. It was also discovered that there was a strong positive relationship between FI and spelling skills and between FI and word study skills.

Estes (1976) also investigated the relationship between FD/FI and reading success at the end of first grade. The effect on the pupil's reading success and the FD/FI of the classroom teachers was also investigated. It was discovered that the reading achievement at the end of grade one was not related to FD/FI for either males or females. There was no significant difference between matched and mismatched pupils with regards to their FD/FI and that of their teachers. This also held true for both sexes.

Watson (1969) did a study with children in grades one, two and three. He found that FI children performed better in selected comprehension tasks than did FD children. Watson (Blanton & Bullock, 1973) also discovered that boys in grades one, two and three that were FI were better readers than FD boys in the same grade. Schwartz (1972) discovered a positive relationship between FI and word recognition skills in the second grade. A significant relationship was also demonstrated between FD/FI and reading

achievement of fourth graders (Conoly, 1977; Kaplan, 1970).

Wineman (1971) did a study with 270 children in grades four, five and six. He investigated the relationship between cognitive style and reading achievement. Wineman found a significant relationship between cognitive style and reading achievement for those students in the fourth grade, both boys and girls. No significant relationship was found for boys or girls in the fifth grade, however. Wineman feels that the impact of adolescence at this grade level caused this result. There was a strong relationship between cognitive style and reading for sixth grade females but not for the males of the same grade.

Cohn (1968) also discovered a positive relationship between FI and reading comprehension among 123 sixth graders. It was found that FI was especially related to comprehension tasks that required reorganization of material or the location of the main idea.

Daku (1978) explored the relationship between cognitive styles and reading achievement in the sixth grade also. When intelligence was controlled, he found no significant difference between FD/FI students on vocabulary and comprehension scores. It was noted, however, that FI students did score high on intelligence tests and on reading tests and that FD students scored low on both.

Stuart (1967) found a positive correlation between FI and reading achievement using seventh and eighth grade students.

Most of the research in this area suggests that there is a positive correlation between FI and reading achievement in the elementary grades. FI students were superior in word recognition and word meaning tasks and demonstrated a positive relationship to comprehension skills at several grade levels (Davey, 1976).

Cognitive Style and Reading--Adults
(High School and College)

A few studies concerning cognitive style and reading achievement with adults were discovered. Although research supports that in primary and elementary grades, FI students are better readers than FD students, Peterson (Chester, 1974) discovered that this relationship disappears before high school. Cardon, (Peterson & Magaro, 1969) however, demonstrated that there was a significant relationship between reading achievement and FI on the Embedded Figures Test with high school boys.

Martin (1979) did a study with 123 college students and explored the relationship between selected academic and personality variables and reading performance. No statistically significant relationship was found on the Hidden Figures Test (a cognitive style test) and reading performance.

Coop and Brown (1970) explored the relationship between teacher-structured presentations and independent-problem solving methods with college students. They found that the teacher-structured presentations were superior to the independent-problem solving methods but also noted was that there was no difference between students with analytic (FI) and non-analytic (FD) cognitive styles.

Gordan and Lang (Davey, 1976) explored the relationship between FI college students and reading skills. It was discovered that a significant relationship existed between FI and word recognition and word meaning tasks. They concluded that perceptual style is implicated in several facets of reading at several development levels. No significant relationship was found between FI and reading ability of college students by Davey (1976). Davey hypothesised that adults learn to adjust their cognitive styles to the changing comprehension tasks.

There does not seem to be a majority agreement on the relationship between cognitive styles and reading achievement of adults. There is little information in this area and much discrepancy among the reseachers. Futher investigations into this area are needed.

Analytic versus Global Approaches to Reading

Much research was concerned with the analytic/global approaches to reading. This research will be discussed as it relates to FD/FI. Witkin defines the FI person as one who is analytical and the FD person as one who is global.

Witkin (Daku, 1978) found that reading requires a great stress on relationships and abstractions. He found that the student needs a more analytical (FI) approach in the process of reading. Mussen, Congen & Kagen (1963) also found that success in reading depends on an analytic (FI) orientation.

Annesley (1971) did a study with fifth grade boys and explored cognitive style as a variable in reading achievement. He found that with intelligence controlled, above average readers used more discriptive part-whole responses than did the average or below average readers. He also discovered that above average readers used more relational-contextual style responses than did the other two groups of readers. Annesley concluded that application of cognitive styles in the educational processes could be of real importance.

Kagan, Moss and Sigel (1963) found that students who were analytic in their response style scored better on performance tests than on verbal tests. They also discovered that these students attended to more factual detail. This was also found to be true by Kagan, Rosman, Day, Albert and Phillips (1964).

Lee, Kagan and Robson (1963) explored three kinds of concepts--analytic, inferential and relational--with third

grade boys. They found that analytic boys learned analytic concepts more readily than the other two groups. They also discovered that the analytic boys were superior to the non-analytic boys in learning concepts based on object similarity of detail among visual stimuli.

It can be seen from the above research that the analytic, or field-independent, student scored better on various reading tasks.

Impulsivity and Reflectivity

Impulsivity and reflectivity will be briefly discussed in this next section of Chapter II. The Matching Familar Figures Test, which will be given to the students in this study, measures impulsivity.

Impulsivity and reflectivity are terms to denote learning styles and refer to an individual's speed in which he makes hypotheses and processes information (Serafica & Sigel, 1970). The impulsive child offers the first answer that occurs to him and is minimally anxious over making mistakes. The reflective child, on the other hand, considers several possibilities before giving an answer. He does not want to make a mistake and likes to be as correct as possible on his first answer (Cross, 1976; Blanton & Bullock, 1973).

Ausburn (1976) did a study with fifteen--seventeen year olds to compare remedial and non-remedial readers with two elements of perception. He felt that "an individual's ability to read is heavily influenced by the style in which he processes letters and words." It was discovered that average readers scored significantly higher on the Hidden Figures Test and on the Matching Familar Figures Test, were more FI and more relfective than the remedial readers.

Kagan (1965), in his study with primary grade children, discovered that reflective children were more accurate in

word recognition tasks than impulsive children. Hood, Kendell & Roettger (1973) and Hood & Kendell (1974) discovered that beginning readers that were reflective made fewer oral reading miscues of word substitution types but more repetitions, regressions and self-corrections than the impulsive children. Johnson (1968), in his study with sixth graders, found that the reflective group scored higher on reading vocabulary and total reading grade points than the impulsive group.

Kagan, Pearson & Welch (1966) discovered that first grade reflective children had more inductive reasoning than the first grade impulsive children. Lesink (1970) found a positive relationship between reflectivity and critical reading skills.

It appears that the reflective students score higher on reading related tasks than impulsive students.

Summary

A strong, positive relationship between field-independent and reading achievement exists, as seen in the research. It appears that children who are field-independent are better readers than field-dependent students. Once strong preferences in cognitive style have been identified, teaching methods should be employed which compliment the cognitive style.

CHAPTER III

PROCEDURE

Introduction

The purpose of this chapter is to provide information on the student population, the testing instruments, and the procedures used in this study.

Population

Twenty-six sixth grade students, 12 males and 14 females, participated in this research. These subjects were enrolled at the Silver Bay Elementary School in the Silverton section of Toms River, New Jersey. This area is a predominately white, middle-class population. Toms River is a growing community and consists of 10 elementary schools, 2 intermediate schools and 3 high schools. The total student population of the Toms River school district is a little over 17,000. The student population of the Silver Bay Elementary School is approximately 1,200. The subjects who participated in this study consisted of students placed within a normal classroom. One of the subjects went to the Resource Room for two hours each day and one subject received Remedial Reading twice a week.

Testing Instruments

Reading Test

The Iowa Tests of Basic Skills, Form 7, Level 12, 1979 were used to measure vocabulary and reading comprehension. The test was administered by the researcher to the twenty-six subjects in October, 1980. The testing was done on two days, one day for the vocabulary testing, the other day on comprehension.

The vocabulary subtest, which began with item 39 and ended with item 80, had a time limit of fifteen minutes.

This subtest measured concept development besides reading and word meaning skills.

The reading comprehension subtest, beginning with item 45 and ending with item 100, had a time limitation of forty-two minutes. The comprehension measured on this subtest was broken down into three categories--facts, inferences and generalizations, which correlate to the literal, interpretative and evaluative levels of reading. Who, what, where and when type questions were used in the factual category. Cause and effect, drawing conclusions and inferences were typical of the questions found in the second category: inferences. Generalization questions were concerned with main ideas, author's purpose, organization, mood and style of the selection.

The Iowa test battery has a strong validity.

> Content specifications are based upon over 40 years of continuous research in curriculum, measurement procedures, and interpretations and use of test results. The 208 skill objectives represented in the tests were determined through systematic consideration of courses of study, statements of authorities in method, and recommendations of national curriculum groups. (Hieronymus, et al. 1979).

V. E. Herrick has stated that the authors should be complimented for the validity of each test item (Daku, 1978).

The Iowa test battery was intended for use in grades three through nine. Standardization of the test was done on a large population. About 16,000 to 19,000 pupils per grade level were used in setting fall norms. A subsample was used on the spring norms. The reliability coefficients for the subtests ranged from .89 to .96 and from .97 to .98 for the composite score. All test items were reviewed by educators and members of minority groups to eliminate any sex-role stereotyping and cultural discrimination.

Cognitive Style Test

The Group Embedded Figures Test (GEFT) was used to measure the cognitive styles of field dependence and field independence. The Group Embedded Figures Test was developed from the Embedded Figures Test to allow for group testing (Witkin et al. 1962).

The Group Embedded Figures Test is a perceptual test. The subjects are to locate a simple figure, seen previously, within a more complex figure in which the simple figure has been obscured.

Witkin et al. (1971) has shown that using the Group Embedded Figures Test one can make inferences about a subject's personality. Cognitive styles, which are self-consistent methods of function, show up in an individual's perceptual and intellectual activities. Cognitive styles are part of a broader dimension of personal functioning and are a part of diverse psychological areas.

The Group Embedded Figures Test is a speed test and is divided into three sections. The First Section, which is primarily for practice, contains seven simple items and has a time limit of two minutes. The Second and Third Sections of the test each contain nine more difficult items and both sections have a time limit of five minutes. When taking the Group Embedded Figures Test, as with the Embedded Figures Test, the subject is not allowed to see the simple form simultaneously with the complex figure in which it is embedded. This was done by printing the simple forms on the back cover of the booklet and the complex forms within the booklet so that both could not be seen at the same time. The subjects were allowed to look back at the simple forms as often as they needed to.

The Group Embedded Figrues Test has a reliability estimate of .82 for both males and females and compares favorably with those of the Embedded Figures Test. It has a validity coefficient of .82 for males and .63 for females.

The Group Embedded Figures Test was administered by this researcher to the sixth grade subjects in January, 1981. The testing was completed in one session and took approximately twenty minutes for all three sections to be completed. a subject who received a Group Embedded Figures Test score above the median of the entire group tested was considered to be field independent. A subject who received a Group Embedded Figures Test score at or below the median of the entire group was considered to be field dependent.

Learning Style Test

The Matching Familiar Figures Test (MFF) was used to measure the learning style of reflective and impulsivity.

The Matching Familiar Figures Test is a perceptual and an individual test. Each subject is shown a picture with a familar object on it, the standard, and a group of six similar pictures, where only one of the group is exactly the same as the standard. If the subject chooses the correct picture, he goes on with the next item. If, however, he makes an error, he is told to choose again, with a maximum of five errors per item. There are a total of twelve items. Latency time to the ½ second is recorded and so is the total number of errors for each item.

Separate norm tables for males and females were set up since research indicates sex differences on both errors and latency. The test has a mean, for eleven year old males, of 8.39 and a standard deviation of 4.82 on total errors. The mean for twelve year old males is 8.00 with a standard deviation of 4.85 for total errors. Females, age eleven, have a mean of 7.47 for total errors and a standard deviation of 4.45. Twelve year old females have a mean of 8.05 and a standard deviation of 4.43 for total errors. Males, age eleven, have a mean of 13.61 and a standard deviation of 10.08 for latency. Twelve year old males, however, have a mean of 12.68 and a standard deviation of 8.34. Females,

age eleven, have a mean of 14.21 and a standard deviation of 8.37 for latency. Twelve year old females have a mean of 12.37 and a standard deviation of 6.20 for latency.

The Matching Familiar Figures Test was administered by this researcher to each of the sixth grade subjects, individually, in January, 1981. Those subjects who scored below the median of the group for errors and above the group's median for latency--slow and accurate--were considered reflective. Those subjects who scored above the median of the group for errors and below the group's median for latency--fast and inaccurate--were considered impulsive.

Administration of Testing Instruments

Iowa Tests of Basic Skills

The vocabulary and reading comprehension subtests on the Iowa Tests of Basic Skills were administered by this examiner in October, 1980. The testing was completed in two days. On the first day the answer sheets were filled out by the students and the vocabulary subtest was given according to the instructions in the examiner's manual. The reading comprehension subtest was administered on the following day according to the instructions in the examiner's manual.

Group Embedded Figures Test

The Group Embedded Figures Test was given by this examiner to all of the sixth grade subjects at one time in January, 1981. The testing took approximately twenty minutes and the time limits in the manual were strictly followed.

Matching Familiar Figures Test

The Matching Familiar Figures Test was administered by this examiner to each of the twenty-six sixth grade subjects individually in January, 1981. The examiner tested nine children each day, taking approximately three days for testing. Latency times were recorded to the ½ second, as well as errors.

Sex Factors

Since sex differences seem to play a part in field dependent and field independent, and also in reflection and impulsivity, the sex of each subject was also recorded to see if it played a part in the variables of this study.

Statistical Plan

Correlations will be used in this research since data from three sets of testing from a group of subjects will be used to see if there are any relationships among those data. Specifically, the statistical analyses that will be used are the biserial correlations and chi-square.

Summary

Twenty-six sixth grade students, 12 males and 14 females, were tested to see if a relationship existed between reading skills, cognitive styles and learning styles. These subjects came from a white, middle-class background. The Iowa Tests of Basic Skills, vocabulary and reading comprehension subtests, were used to measure reading skills. The Group Embedded Figures Test was used to determine cognitive styles and the Matching Familiar Figures Test was used to determine learning styles. Sex differences were also recorded in this study. All testing was done by this researcher during the 1980-1981 school year.

CHAPTER IV

RESULTS

Introduction

This study was done to examine the relationship between cognitive style (field dependence/field independence) and reading achievement (reading vocabulary and reading comprehension). Also, the relationship between learning style (reflective and impulsive) and reading achievement (reading vocabulary and reading comprehension) was investigated. Sixth grade students were used and sex differences were noted.

Twenty-six sixth grade students were tested. The Group Embedded Figures Test was used to determine field dependence/field independence while the Matching Familiar Figures Test was given to determine reflective and impulsive students. Reading vocabulary and reading comprehension scores were obtained by administration of the Iowa Tests of Basic Skills.

Statistical analyses used were biserial correlations and chi-square.

Plan of Chapter

This chapter is arranged so as to have each hypothesis with statistical analysis examined and discussed. Sex differentiation is also discussed and statistical analysis examined for each hypothesis.

The First Hypothesis

Hypothesis One was concerned with the relationship among cognitive style (field dependence/field independence) and reading vocabulary and reading comprehension.

The raw score vocabulary mean for the field independent group was 7.27 and for the field dependent group was 7.14. The mean of all subjects tested was 7.2. These results, along with the standard deviations are presented in Table 1.

TABLE 1

CORRELATIONS BETWEEN READING VOCABULARY AND READING COMPREHENSION WITH RESPECT TO FIELD DEPENDENCE AND FIELD INDEPENDENCE

	Field Dependence	Field Independence	Total
Vocabulary			
N	13	11	24
X	7.14	7.27	7.2
SD	.91	1.26	1.06
r_{bis}	.08	.09	--
Comprehension			
N	13	11	24
X	7.83	7.69	7.67
SD	1.14	2.15	1.64
r_{bis}	.13	.02	--

The raw score comprehension mean for the field independent group, as noted in Table 1, was 7.69 and for the field dependent group was 7.83. The mean of all sbujects tested was 7.67.

A negligible correlation was found to exist between field dependence and vocabulary and also between field independence and vocabulary as evidenced by a biserial r correlation of .08 and .09 respectively. A negligible correlation was also found between field dependence and comprehension and between field independence and comprehension as evidenced by a biserial r correlation of .13 and .02 respectively.

Sex Differentiation for Hypothesis One

In this study there were six field independent males and five field independent females. The field dependent group consisted of four males and nine females. Sex differences were analyzed using the chi-square analysis. No significant differences were noted based upon sex, as illustrated in Table 2.

TABLE 2

CHI-SQUARE ANALYSIS OF
SEX DIFFERENCES FOR FD AND FI SUBJECTS

Group	Male	Female	Total
FD	4	9	13
FI	6	5	11
Total	10	14	24

Note: $X^2 = 1.38$, df = 1. A X^2 value of 3.84 is needed for significance at the $p < .05$ level.

The Second Hypothesis

Hypothesis Two was concerned with the relationship among learning style (reflection and impulsion) and reading vocabulary and reading comprehension.

The raw score vocabulary mean for the reflective group was 7.38 and the raw score vocabulary mean for the impulsive group was 7.21. The mean total for reflective plus impulsive was 7.24. These results, along with the standard deviations are presented in Table 3.

TABLE 3
CORRELATIONS BETWEEN READING VOCABULARY AND READING COMPREHENSION WITH RESPECT TO REFLECTIVITY AND IMPULSIVITY

	Reflectivity	Impulsivity	Total
Vocabulary			
N	10	10	20
$\bar{X}$	7.38	7.21	7.24
SD	1.06	1.08	1.02
r_{bis}	.18	.03	--
Comprehension			
N	10	10	20
$\bar{X}$	8.3	7.87	8.09
SD	1.48	1.85	1.64
r_{bis}	.16	.16	--

The raw score comprehension mean for the reflective group was 8.3 and for the impulsive group was 7.87. The mean of all subjects tested was 8.09.

A negligible correlation was found to exist between reflectivity and vocabulary and also between impulsivity and vocabulary as evidenced by a biserial r correlation of .18 and .03 respectively. Also, a negligible correlation was found between reflectivity and comprehension and between impulsivity and comprehension as evidenced by a biserial r correlation of .16 and .16 respectively.

Sex Differentiation for Hypothesis Two

In this study there were five reflective males and five reflective females. The impulsive group consisted of four males and six females. Sex differences were analyzed using the chi-square analysis. No significant differences were noted based upon sex, as illustrated in Table 4.

TABLE 4

CHI-SQUARE ANALYSIS OF
REFLECTIVE AND IMPULSIVE SUBJECTS

Group	Male	Female	Total
Reflective	5	5	10
Impulsive	4	6	10
Total	9	11	20

Note: $X^2 = .2$, df = 1. A X^2 value of 3.84 is needed for significance at the $p < .05$ level.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study did not find any significant relationship between field dependence/field independence and reading vocabulary and between field dependence/field independence and reading comprehension. Also, no significant relationship was found between reflection and reading vocabulary and reading comprehension nor between impulsion and reading vocabulary and reading comprehension. Therefore, both Hypotheses One and Two were considered null.

When differences between males and females were considered, no significant differences were discovered.

Thus, the findings in this study are in conflict with the research indicated by the literature which often points to a positive and significant relationship between reading achievement and cognitive style and also between reading achievement and learning style.

Taken at face value, these results seem to indicate that cognitive styles and learning styles are negligibly related to reading achievement. However, the sample size used in this study must be considered. Although twenty-six students were tested, only twenty-four were classified as field dependent/field independent and only twenty as reflective or impulsive. Much of the previous research in this area used larger samples and the distinct possibility exists that a larger sample size would have produced a different relationship between field dependence/field independence and reading achievement and between reflectivity/impulsivity and reading achievement.

It is possible that cognitive style and reading achievement is influenced by age and maturity as suggested by Peterson (Chester, 1974), Davey (1976) and Witkin (Peterson and Magaro, 1969).

The impact of adolescence could also have affected the relationship between cognitive styles, learning styles and reading achievement in this study. Wineman (1971) suggests this to be a factor when he did not find any significant relationship between cognitive style and reading achievement for fifth grade boys and girls. The impact of adolescence might also hold true for students in the sixth grade and could have affected the results of this study.

Intelligence is another factor to be considered. If intelligence was controlled, scores may have been different, as suggested by Daku (1978).

All of the tests in this study were administered by this researcher in accordance with the directions and time limitations supplied with each test. Therefore, no error is assumed in the administration and scoring of the tests.

Suggestions for Further Research

The relationship between cognitive style, learning style and reading achievement is still an important area for consideration in the teaching of reading. This study was only a small part of that dimension. Further research in this field should be directed at the following:

1. The study should be replicated using a larger sample at the sixth grade level.
2. The study should be replicated at various grade levels.
3. The study should be replicated at the sixth grade level but with intelligence controlled.
4. The study should be replicated at various grade levels with intelligence controlled.
5. Cognitive styles and learning styles should be investigated in relation to various levels of comprehension.

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